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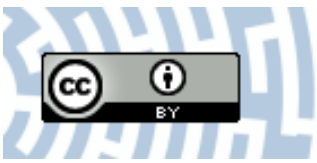

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THE ETHICAL CONCERNS ABOUT GIS

ETYCZNE NIEPOKOJE ZWIĄZANE Z SYSTEMAMI GIS

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Introduction

Nowadays information is being generated in greater quantities and at higher frequency than at any time in human history. Information is penetrating and transforming nearly every aspect of our global life, thanks tremendous growth of information and communication technologies and the creation of the new digital world.

Such applications of Information and Communication Technologies (ICT), as using Geographic Information Systems (GIS), bring great promises and at the same time raise concerns about its power and its abuse. Consequently, developments in information systems involve important ethical considerations in how information is used. According to some thesis (Gaździcki, 2003) – ethical questions arise when using spatial information, geomatics and GIS tools, technology and applications, seems more deeply and dramatic with time passing. Ought to be remembered that ethics is the philosophical framework that is used to maximize the good we do and minimize the harm (Craig, 2004). This paper focuses on GIS from the ethical discourse and dilemmas point of view and tries to show the underpinning and providing role of the GIS Code of Ethics.

Access to information and ethics involvement

The power of GIS technologies is mostly used for beneficial purposes, but these should also enhance the quality of life, promote equity in access to knowledge, reduce socio-economic gaps and create other ”good purposes”. However looks like numerous “grey” areas exist in the use of GIS and in many instances, „fair, just, and equitable” conduct and results are not obvious (Lynch, 2000). They often depend on the perspectives of those affected by use of the information systems.

The broad issues relating to electronic information systems include control of and access to information, privacy and misuse of data, international considerations, the speed and efficiency.

Such specifically systems as GIS, which include local and global networks, databases, and programs for processing information, force people to confront entirely new rights and responsibilities in their use of information and to reconsider standards of conduct of computers and information systems. Certainly, specific problems require slightly different kinds of ethical decisions. These include moral choices made by individuals in relation to the rest of the community, standards of acceptable behaviour and rules governing members of a profession, what really means ethics.

Ethical backgrounds

Ethics as a discipline of study and practice, with historical antecedents, is dating to the philosophy of Confucius and Aristotle. Its application to computers is dating with the work of mathematician and philosopher, Norbert Wiener (Wiener, 1950).

Ethics refers to principles of human conduct, or morals, and to the systematic study of such human values, or the study of theories of conduct and goodness, and of the meanings of moral terms, which is called moral philosophy, the study of theories of conduct and goodness and of the meanings of moral terms (Longhorn, 2004).

These set of rules help to guide the human actions of an individual human being so that they are consistent with his or her values. The function of ethics is to serve coordination or cooperation of our choices and actions to mutual benefit through self-discipline (EPIC, 2005). Ethics concerns itself with questions such as when is an action 'right' or 'wrong' and what standards separate 'good' from 'bad'. However, the term of "ethics" could be used in several different ways:

- Ethics means the study of morals. It is also the name for that branch of philosophy concerned with the nature of morals and moral evaluation – e.g. what is right and wrong, virtuous or vicious, and beneficial or harmful (to others).
- The term ethics or morality is used to mean the standards for ethical or moral behaviour of a particular group, such as "Roman Catholic morality" or "Buddhist ethics" or "nursing ethics" or "the professional ethics of engineers".
- *Descriptive ethics* gives a description of such ethical codes and standards, does not require making a judgment as to whether the code or standards of behaviour have ethical justification. The examination of the adequacy of moral or ethical values, standards or judgments gives the *normative ethic.*
- Some authors use the term "ethics" or "morality" more loosely to mean any code of behaviour, even one that does not claim to have moral justification, e.g. corporation's "ethics" or "morality" – and takes it to include such judgments as "What is right is what the guy above you wants from you". Such a judgment is most effective way to survive in the organization, but does not pretend to be a statement about what is morally/ethically justified.
- Formally, **ethics** is the study of morals and values. **Morals** – are rules that govern behaviour. When we ask what is right and what is wrong, these are questions of morality. **Values** – are states of affairs that are desired by and for people. They are goals or ends that are sought. Common goals include happiness, health, life, and wealth.

The essential differences between ethical symptoms, problems, dilemmas, and conditions are often ignored, but are helpful to fully grasping a situation:

- **Ethical symptoms** are the evidence of fundamental conflicts within a community. Symptoms, by themselves, are not solved.

- **An ethical problem** is a situation raising an opportunity for choice where there is a perceived gap between a vision of what is right and good and the current reality of the situation provided there is a reasonable expectation that human action will fill it.
- **An ethical dilemma**, by way of contrast, is a situation demanding a choice between two or more options that are equally desirable or undesirable**.**
- **Ethical conditions** are situations that are fundamentally wrong and/or bad, which cannot be changed at all, or, if they can be changed, cannot be changed ethically.

Some issues of Approaching Ethics

There are some critical approaches to ethics (Valasquez et al., 2005).

The Virtue Approach – focuses on attitudes, dispositions, or character traits that enable us to be and to act in ways that develop our human potential, as: honesty, courage, faithfulness, trustworthiness, integrity, etc.

The Utilitarian Approach – focuses on the consequences that actions or policies have on the well being (”utility”) of all persons directly or indirectly affected by the action or policy.

The Rights Approach – identifies certain interests or activities that our behaviour must respect, especially those areas of our lives that are of such value to us that they merit protection from others. Each person has a fundamental right to be respected and treated as a free and equal rational person capable of making his or her own decisions. This implies other rights (e.g., privacy free consent, freedom of conscience, etc.) that must be protected, if a person is to have the freedom to direct his or her own life.

The Fairness (or Justice) Approach – focuses on how fairly or unfairly our actions distribute benefits and burdens among the members of a group. Fairness requires consistency in the way people are treated.

The Common Good Approach – presents a vision of society as a community whose members are joined in a shared pursuit of values and goals they hold in common. The community is comprised of individuals whose own good is inextricably bound to the good of the whole.

The bases for GIS Code of Ethics

The rapid development of technology in recent decades presents significant implications to society and the natural environment. The field of GIS has evolved faster than social and legal scientists' ability to evaluate the potential impacts of these new tools. Seems we have an incomplete understanding of the full implication of these spatial information technologies on society and the environment. A code of ethics for professionals and practitioners both defines a professional's responsibility to the discipline of GIS and is the first step in addressing public concerns (FGDC, 1998).

"*The code is based on the ethical principle of always treating others with respect and never merely as means to an end. It requires us to consider the impact of our actions on other persons and to modify our actions to reflect the respect and concern we have for them" –* these ideas came from geographer and philosopher Emanuel Kant. Codes of ethics serve an important role. For societies or associations that do not implement formal professional qualification or certification standards for membership, a code of ethics or conduct still

serves, as a valuable guide for how members of that society should act in their employment and in relation to their colleagues, clients and society generally.

Professionals working with GIS are entering a new, evolving, and multidisciplinary field. GIS has been defined as a powerful set of tools for collecting, storing, retrieving, transforming and displaying spatial data from the real world (Burrough, 1986). The GIS professional can perform complex spatial analyses by combining large databases that list attributes about people, their activities, and the environment. Increasingly, GIS professionals are building systems that affect people's lives, explore solutions to issues of privacy, data quality, and liability.

A code establishes goals the professional can aspire to, set guidelines for professional expectations, and serve as a source of public evaluation. University of Wisconsin-Madison (USA) in the Environmental Monitoring Program (2001) prepared some important issues that should had been stressed in a GIS code of ethics (Curtis et al., 2001), as listed below:

Social Implications

- Promote procedures that protect health, safety and welfare of people and the environment and meet and institutional objectives.
- Consider the short and long-term relevancy.
- Represent your organization in a socially responsible manner.
- Contribute to society's well being.
- Respect the privacy of others.
- Avoid causing harm.
- Evaluate moral and legal imperatives.

Professional Integrity

- The GIS professional shall be diligent about the completion of his or her duties, and do so in such a way that it reflects well on the individual and the profession.
- Respect privacy – follow all relevant laws on privacy and disclosure.
- Be open and transparent about limitations and uncertainty in data
- Avoid misleading data presentation
- Avoid conflicts of interest
- Understand limits of competence
- Acknowledge other's contributions

Competency and Professional Development

- Continue to upgrade professional knowledge and skills.
- Maintain professional knowledge; seek information about current laws, accepted practices, and relevant standards pertaining to professional work.
- Maintain an interest in professional organizations and their activities.
- Accept and provide appropriate employment review.
- Consult, when necessary, with colleagues in their areas of expertise.
- Continue to develop professional skills that supplement technical skills, such as communication, project management, and productive peer relations.

Professional Relations

- Encourage others to adhere to this code.
- Seek the advice from one's colleagues when faced with an ethical dilemma.
- Review the work of others in an objective, candid, and properly documented way.
- Respect and seek, when necessary, professional review and opinions from colleagues in their areas of competence.
- Give a fair hearing to the opinion, concerns, or complaints of a colleague.
- Do not unfairly intervene in the career of any colleague; however concerns for the

employer, client, or the public interest may compel GIS professionals, in good faith, to question the competence of a colleague.
- Assist colleagues in professional development.
- Take appropriate action if one discovers a colleague engaging in unethical behaviour.

Professional Responsibility
- Work toward the best possible data quality and integrity.
- Assure Accountability.
- Promote public knowledge of correct use of GIS.
- Comply with laws and mandates.
- Keep current with this code and any updates or amendments.
- Adhere to appropriate data security procedures.
- Acknowledge any sources of data that are used in any project.

The academic philosophies of ethical theory, followed by detailed treatment of four fundamental issues: codes of ethics, intellectual property rights, professional accountability and data protection. The intention of the article is not to describe ethical problems connected with all these subjects. Seem the codes of ethics for professionals is more valuable in the context of the paper.

Codes of Ethics for Professionals

Urban and Regional Information Systems Association in 2003 defined the Code of Ethics for GIS Professionals (URISA, 2003), which is intended to provide guidelines for GIS professionals and practitioners. It should help professionals make appropriate and ethical choices and provide the basis for evaluating their work from an ethical point of view. This Code of Ethics is based on the ethical principle of always treating others with respect and never merely as means to an end – deontology (Immanuel Kant). Also it emphasizes one's obligations to other persons, to one's colleagues and the profession, to one's employers, and to society as a whole. Those obligations provide the organizing structure for these guidelines (Craig, 1993). The URISA ethical policy structures itself around four types of ethics:
- View persons who exemplify morality as your own guide (Virtue Ethics).
- Attempt to maximize the happiness of everyone affected (Utilitarianism).
- Only follow maxims of conduct that everyone else could adopt (Kantianism).
- Always treat other persons as ends, never merely as means (Deontology).

The text of The Code draws on the work of many professional societies. A few of the guidelines that are unique to the GIS profession include the encouragement to make data and findings as widely available as is feasible, to document data and products, to be actively involved in data retention and security, to show respect for copyright and other intellectual property rights, for privacy of data and to display concern for the sensitive data about individuals discovered through geospatial or database manipulations.

The Code consists of these four primary categories:

I. Obligations to Society – the GIS professional recognize the impact of his or her work on society as a whole, on subgroups of society including geographic or demographic minorities, on future generations, and inclusive of social, economic, environmental, or technical fields of endeavour.

II. Obligations to Employers and Founders – the GIS professional recognize that he or she has been hired to deliver needed products and services. The employer (or founder) expects quality work and professional conduct.
III. Obligations to Colleagues and the Profession – the GIS professional recognize the value of being part of a community of other professionals. Together, we support each other and add to the stature of the field.
IV. Obligations to Individuals in Society – the GIS professional recognizes the impact of his or her work on individual people and will strive to avoid harm to them.

An issue that is closely tied to many codes of ethical conduct it is professional accountability. In general, accountability lies at the root of vendor-client relationships, and is therefore relevant to our professional behaviour in consulting or professional work, especially with those who make use of our products or advice. Accountability is important because it shows that high-quality work is valued, encourages professionals to be diligent and responsible in their practice, and establishes just foundations for punishment and/or compensation when the work does not perform according to expectations, or when professional advice turns out to be unreliable.

Intellectual Property Rights (IPR) concern the protection of all products created or designed by the human intellect, including software. Where professional ethics are concerned, it is primarily the protection, or violation of that protection, of software programs, as these connected with GIS (Cho, 1998). It is not discuss here the legal background to IPR and the justification for protecting copyright, drawing upon codes of ethics and conducive to the development of professional ethics. IPR can born a kind of the deontological dichotomy between rights and duties also imposes a duty of quality and professionalism on the developers of the software involved with GIS.

The GIS Code of Ethics provides only general guidelines, not conduct of specific rules.

There is not universal agreement on whether formal, legally binding sanctions are required or need to be strictly enforced in relation to achieving the ultimate goal of producing a code of ethics or professional conduct. In one sense, imposition of sanctions indicates that the code of ethics has not achieved this goal, at least in respect to certain members' behavior (Blakemore M., Longhorn R., 2004). The URISA, The GIS Certification Institute and other GIS institutions and experts continues to work even after the Code of Ethics has been adopted and certifying professionals formally.

Recapitulation

The GIS professionals have many opportunities to do harm and to do good, same as professionals from other important disciplines. The interest of GIS professionals on ethical problems is increasing, but seems is not enough strong. Future developments in the professionalism of information systems are explored, and questions are raised concerning the way in which GIS is regulated, and the role it may play in the future.

The consideration of GIS ethics, or more widely in ethics of geomatic in Polish literature was increased more deeply few years ago and was concerned by a few authors (Gaździcki, 2003). The listed ten potential causes of difficulties in Polish geomatics, the 7-th one was pointed as an insufficient level of ethics in official and professional circles (Gaździcki, 2005). This problem was also cached in a sentence: "At the first it is an ethics" (Zieliński, 2004) and was presented in Croatia (Styblińska, 2005). Latest hopeful signal about the movement in this subject is connected with a process of teaching students (Hycner, Dobrowolska-Wesołowska, 2008).

The ethical behavior is predicated on two main pillars: a commitment to discharging our obligations to others in a fair and honest manner, and a commitment to respecting the rights and dignity of all persons. We all try to make the right decisions, but sometimes it is not obvious what that decision should be (Waters, 2004). The Code of Ethics for the GIS Professional is a foundation document that sets guidelines for making ethical decisions.

However, we all have an obligation of responsibility – it does seem necessary that we act to maintain our professional independence, regulate our professional culture in a manner of our choosing and identify the ethical values to which we aspire through codes of professional ethics that are appropriate for our various cultures, times places, and spaces.

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Abstract

Developing and applications of newest information and communication technologies (ICT) in Geographic Information Systems (GIS), plays critical role in a global life, bringing great promises in so many aspects. At the same time raise concerns about its power and its abuse. The GIS professionals have many opportunities to do harm and to do good, same as professionals from other important disciplines.
Ethical questions arise when using spatial information, geomatics and GIS tools, technology and applications, seems more deeply and dramatic with time passing. The ethical behaviour is predicated on two main pillars: a commitment to discharging our obligations to others in a fair and honest manner, and a commitment to respecting the rights and dignity of all persons.
This paper focuses on GIS from the ethical discourse and dilemmas point of view. It describes some ethical principles and approaches and also tries to show the underpinning and providing role of the GIS Code of Ethics.

Streszczenie

Nowoczesne technologie informatyczne i komunikacyjne wykorzystywane i rozwijane w systemach GIS odgrywają znaczącą rolę w życiu naszego globu. Systemy GIS przynoszą ogromne profity, ale także mogą stać się powodem nadużyć i nierzetelności lub wręcz szkody i zniszczenia. Dlatego wraz z rozwojem informacji przestrzennej, geomatyki, czy systemów GIS w sposób dramatyczny pojawiają się pytania związane z etyką i stosowaniem zasad postępowania etycznego w wymieniowych dziedzinach.
Profesjonaliści związani z systemami GIS, znajdują wiele możliwości i sposobów, by wykonać coś dobrze i rzetelnie lub by wyrządzić szkodę i dokonać nadużyć, podobnie jak większość specjalistów, związanych z bardzo istotnymi dyscyplinami.
Zachowania etyczne opierają się na dwóch podstawowych filarach: zobowiązaniu wykonania naszych zadań wobec innych w sposób rzetelny i uczciwy oraz na zobowiązaniu do poważania i szanowania wszystkich ludzi, ich godności i przestrzegania prawa.
Artykuł koncentruje się na etycznych problemach i dylematach pojawiających się wraz z systemami GIS oraz określa wagę i istotę Kodeksu Etyki GIS.

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